

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF MATHEMATICS		
LEVEL OF STUDIES	UNDERGRADUATE PROGRAM		
COURSE CODE		SEMESTER	B
COURSE TITLE	LINEAR ALGEBRA I		
INSTRUCTOR	Vasileios Metaftsis		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	CREDITS
		6	9
COURSE TYPE	General knowledge		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	http://www.math.aegean.gr/index.php/en/academics/undergraduate-programs		

(2) LEARNING OUTCOMES

Learning outcomes
Ability to calculate base and dimension of a vector space. Ability to calculate inner product. Understanding of the relationship between matrices and linear functions and ability to move between those two entities. Ability to calculate determinants. Geometric interpretation of vector subspaces and ability to calculate subspaces. Ability to find base change matrices.
General Competences
Working independently. Team work. Working an interdisciplinary environment.

(3) SYLLABUS

<ol style="list-style-type: none"> 1. Matrices, matrix multiplication, matrix properties, inverse, transpose, symmetric, orthogonal matrix. 2. Definition of a determinant function. Existence and uniqueness of the determinant function. Properties of determinant. Adjoint matrix. Find an inverse matrix with the help of an adjoint matrix. 3. Definition of vector spaces. Examples. Vector subspaces. Finitely generated vector spaces. Sum and intersection of vector subspaces. 4. Linear dependence/independence of vectors. Base and dimension of vector spaces. Dimension theorem of the sum of vector subspaces. 5. Properties of the 2-dimensional and 3-dimensional Euclidean spaces as vector spaces. Geometric interpelation of vector spaces. 6. Definition of linear functions. Properties. Matrix of a linear function. Change base matrix. Matrix of the composition of linear functions. Similar matrices. 7. Kernel and image of linear functions. Rank of a linear function and a matrix. Rank-nullity theorem. 8. Isomorphism of vector spaces. Classification of vector spaces. The vector space of linear functions.

TEACHING MATERIAL DISTRIBUTION	The teaching material of the course is uniformly distributed during the semester.
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(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Face-to-face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	<ul style="list-style-type: none"> • Communication with students via e-mail • Course material is regularly uploaded to instructor's webpages 	
TEACHING METHODS	Activity	Semester workload
	Lectures	52
	Tutorials	26
	Independent study	147
	Course total (25 per ECTS)	225
COURSE COMMITMENTS	Attending course and tutorial sessions is not obligatory.	
STUDENT PERFORMANCE EVALUATION	Student's evaluation is done in Greek through a written examination which includes short-answers questions and problem solving. For students with disabilities, evaluation takes place via oral exams	

(5) ATTACHED BIBLIOGRAPHY

<ol style="list-style-type: none"> 1. Linear Algebra and Analytic Geometry, Thanassi Cryssakis. 2. An introduction of linear algebra, D., Varsos, D. Deriziotis, I. Emmanouil, M. Maliakas, A. Melas, O. Taleli.
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